Santa Rosa Plain Monitoring Program Framework
Goals and Elements
Working Draft

NEED, IMPORTANCE & GOALS

Monitoring Requirements per Water Code

To be eligible for state funding administered by the California Department of Water Resources (DWR) the Water Code requires that a monitoring program be a component of a groundwater management plan, specifically:

- Include components relating to the monitoring and management of groundwater levels groundwater quality, inelastic land subsidence, changes in surface-water flow and surface-water quality that directly affect groundwater levels or quality or are caused by groundwater pumping, and a description of how recharge areas identified in the plan substantially contribute to the replenishment of the groundwater basin.

- Adopt monitoring protocols to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin. The monitoring protocols will be designed to generate information that promotes efficient and effective groundwater management

Importance of Monitoring

- **Groundwater management cannot be accomplished without the monitoring and measurement of basic hydrologic parameters in the basin.**
- Groundwater systems are dynamic and adjust continually to short-term and long-term changes in climate, groundwater withdrawal, and land use
- Monitoring provides information on the status of the resource
- Monitoring is the principal source of information about the hydrologic stresses acting on aquifers and how these stresses affect groundwater recharge, storage and discharge

Goals of the Monitoring Program

- Develop and maintain sufficient data of adequate quality to assess the status and trends of groundwater-levels, groundwater quality and surface water/groundwater interaction within the basin and responses to future management actions
- Establish monitoring protocols to ensure the adequacy, quality and consistency of data collected, and a framework and format for data collection and maintenance

MONITORING PROGRAM ELEMENTS

1. Groundwater elevation monitoring
2. Groundwater quality monitoring
3. Inelastic land surface subsidence
4. Surface water-groundwater interaction monitoring
5. Assessment of data gaps/additional monitoring needs
6. Monitoring protocols
7. Data management system
8. Prioritization of monitoring needs

Groundwater-Level Elevation Monitoring

Rationale/Purpose

- Provide estimate of amount of groundwater in storage in the basin
- Provide essential information to evaluate changes over time
- Develop groundwater models and forecast trends
- Design, implement and monitor effectiveness of groundwater management program

Potential Elements

1. Current groundwater elevation monitoring - historic, long-term water level monitoring
    a. DWR monitoring
    b. Other historic and ongoing monitoring efforts
    c. CASGEM Monitoring Program
2. Data gaps/additional groundwater elevation monitoring needs
3. Establish a standardized network suitable to meet the goals of the monitoring program
4. Frequency of monitoring
5. Data management and evaluation of groundwater elevation data
6. Process enhancing/refining monitoring network

Groundwater Quality Monitoring

Rationale/Purpose

- Track status and trends of groundwater quality within basin
- Protect the health of basin users
- To assess effect of human and natural factors on groundwater and surface water
- Understand groundwater flowpaths within the basin

Potential Elements

1. Current monitoring for water quality information from public water supply wells, and historic, long term water quality monitoring
    a. Public supply wells
    b. DWR monitoring of private wells
    c. USGS GAMA program monitoring
    d. Planned Salt and Nutrient Monitoring
    e. Contaminant Release Sites
    f. Others
2. Data gaps/additional groundwater quality monitoring needs
3. Establish a standardized network suitable to meet the goals of the monitoring program
4. Frequency of monitoring
5. Data Management and evaluation of groundwater quality data
6. Process for enhancing/refining monitoring network

Inelastic Land Surface Subsidence

Rationale/Purpose

- Monitor for elastic and inelastic subsidence, but will need to be addressed in the groundwater management plan
- Used to monitor changes in elevation due to discharge and recharge
- Data may be useful to estimate groundwater storage changes over time
- Inelastic subsidence largely unrecoverable loss of groundwater storage capacity, and occurs in fine grained sediments

Potential Elements

1. Research of available data related to potential inelastic land subsidence due to groundwater extraction in the Santa Rosa Plain Watershed
    a. InSAR data
    b. Plate Boundary Observatory (PBO) GPS Stations
    c. Other data (eg, survey data)
2. Develop monitoring program and network for assessing potential for inelastic land subsidence due to groundwater extraction

Surface Water-Groundwater Interaction Monitoring

Rationale/Purpose

- Develop a better understanding of the relationship between surface water and groundwater
- Provide information on locations of groundwater recharge/discharge areas
- Evaluate seasonal and long-term changes in groundwater recharge/discharge
- Design, implement and monitor effectiveness of groundwater management program

Potential Elements

1. Historic and current surface water-groundwater interaction elevation monitoring
    a. Network of stream gauges in Santa Rosa Plain watershed
    b. Groundwater monitoring wells near water courses and stream gages
    c. A map identifying the recharge areas in the basin
    d. USGS coupled surface water-groundwater flow model (GSFLOW)
2. Data gaps/Additional monitoring needs
3. Establish a standardized network suitable to meet the goals of the monitoring program
4. Frequency of Monitoring
5. Data Management and evaluation of data
6. Process for enhancing/refining monitoring network

Monitoring Protocols
Develop standard monitoring protocols to facilitate the collection, management and reporting of high quality consistent data.

Data Management System
Develop a data management system for the centralized storage, maintenance, and evaluation of high quality data collected under the GMP.

Prioritization of Additional Monitoring Needs
Additional monitoring needs identified through the assessment of data gaps will be evaluated in terms of cost and prioritized to plan for future funding of the monitoring program.